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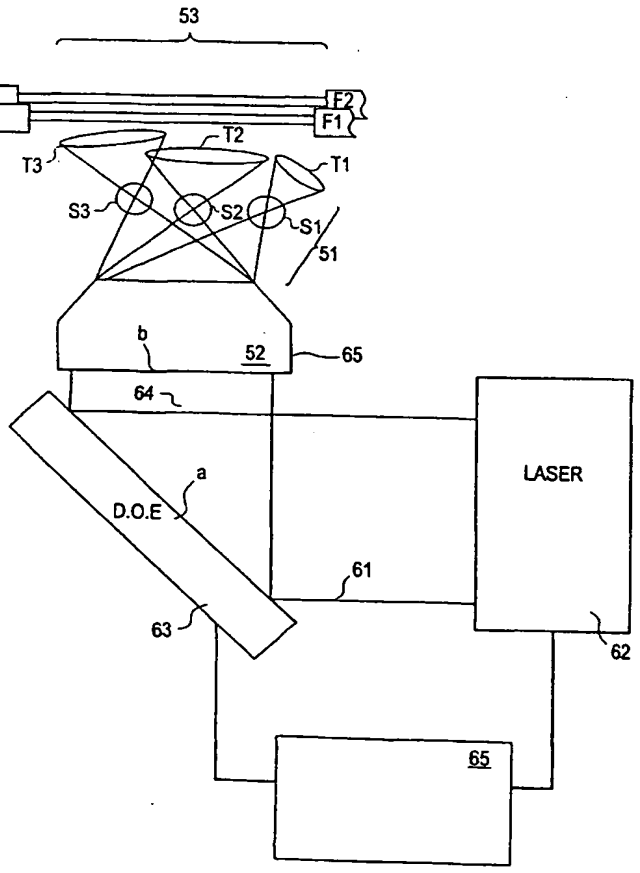
(54) Title: OPTICAL SWITCHES AND ROUTERS AND OPTICAL FILTERS



(57) Abstract: Our invention relates generally to an optical switch (31) and an optical router (10) to rapidly route signals from particular channels (22, 24) within an optical band by using optical switches (20) which utilize a controlled whispering gallery mode (WGM) resonance of dielectric microspheres (S1, S2, S3) to optically switch signals. Another invention relates to optical filters which use a WGM resonate structure (150) to isolate and switch specific optical signals between waveguides (F1, F2). In other inventions, the filter (100) is switched "on/off" by signal loss within a WGM resonate structure (150) which disrupts the WGM resonance; the filter (100) isolates and switches a specific wavelength signal from among a group of signals of different wavelengths; and is switched "off" by adjusting the index of refraction of the resonate structure to become substantially similar to the index of refraction of the surrounding medium.

WO 03/001260 A1

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